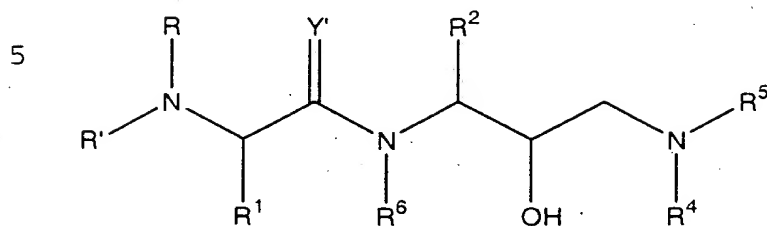


What is Claimed is:

1. A compound represented by the formula:



10
(Formula I)

15 or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein:

R represents hydrogen, alkoxycarbonyl, aryloxycarbonylalkyl, aralkoxycarbonyl, alkylcarbonyl, cycloalkylcarbonyl, cycloalkylalkoxycarbonyl, cycloalkylalkanoyl, alkanoyl, aralkanoyl, aroyl, aryloxycarbanoyl, aryloxyalkanoyl, heterocyclylcarbonyl, heterocycloxy carbonyl, heteroaralkoxycarbonyl, heterocyclylalkanoyl, heterocyclylalkoxycarbonyl, heteroarylcarbonyl, heteroaryloxycarbonyl, heteroaroyl, alkyl, alkenyl, cycloalkyl, aryl, aralkyl, aryloxyalkyl, heteroaryloxyalkyl, hydroxyalkyl, aralkylaminoalkylcarbonyl, aminoalkanoyl, aminocarbonyl, aminocarbonylalkyl, alkylaminoalkylcarbonyl, and mono- and disubstituted

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aminocarbonyl and aminoalkanoyl radicals wherein the substituents are selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl, heteroaryl, heteroaralkyl, heterocycloalkyl, alkoxy carbonyl, arylalkyloxy carbonyl, and heterocycloalkylalkyl radicals, or in the case of disubstituted aminoalkanoyl, said substituents along with the nitrogen atom to which they are attached form a heterocyclyl or heteroaryl radical;

R' represents radicals defined for R¹, or R and R' together with the nitrogen to which they are attached form a heterocycloalkyl or heteroaryl radical;

R¹ represents hydrogen, -CH₂SO₂NH₂, -CO₂CH₃, -CH₂CO₂CH₃, -C(=O)NH₂, -C(=O)NHCH₃, -C(=O)N(CH₃)₂, -CH₂C(=O)NHCH₃, -CH₂C(=O)N(CH₃)₂, alkyl, thiolalkyl and the corresponding sulfoxide and sulfone derivatives thereof, alkenyl, haloalkyl, alkoxyalkyl, alkynyl and cycloalkyl radicals and amino acid side chains selected from the group consisting of asparagine, S-methyl cysteine and the corresponding sulfoxide and sulfone derivatives thereof, glycine, leucine, isoleucine, allo-isoleucine, tert-leucine, alanine, phenylalanine, ornithine, histidine, norleucine, glutamine, valine, threonine, allo-threonine, serine, aspartic acid and beta-cyano alanine, side chains;

R² represents alkylthioalkyl, cycloalkylthioalkyl or arylthioalkyl radicals, which radicals are optionally substituted with a substituent selected from the group

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consisting of $-\text{NO}_2$, $-\text{OR}^{15}$, $-\text{SR}^{15}$, and halogen radicals, wherein R^{15} represents hydrogen and alkyl radicals;

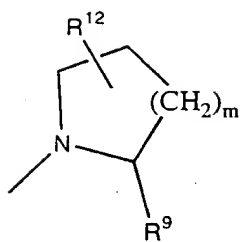
R^3 represents hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, and heteroaralkyl radicals;

Y' represents O, S and NR^3 ;

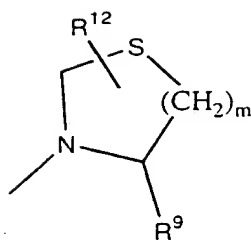
R^4 and R^5 together with the nitrogen atom to which they are bonded represent a N-heterocyclic moiety; and R^6 represents hydrogen and alkyl radicals.

2. A compound of Claim 1 where R^4 and R^5 together with the nitrogen atom to which they are bonded represent a N-heterocyclic moiety containing 5, 6 or 7 members when monocyclic, 5, 6 or 7 members in a ring with 1, 2 or 3 members in a bridge when a bridged monocyclic, 11, 12 or 13 members when bicyclic, and 11 to 16 members when tricyclic.

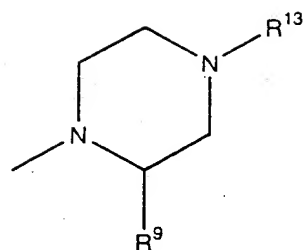
3. A compound of Claim 2 where R^4 and R^5 together with the nitrogen atom to which they are bonded form a N-heterocyclic moiety selected from the group consisting of formulae (A) through and including (J)



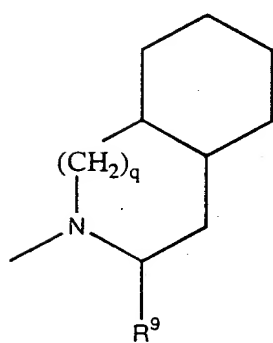
(A)



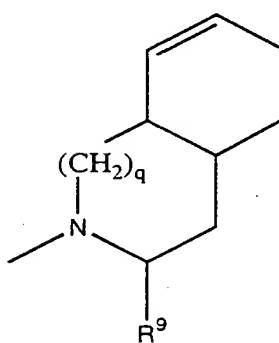
(B)



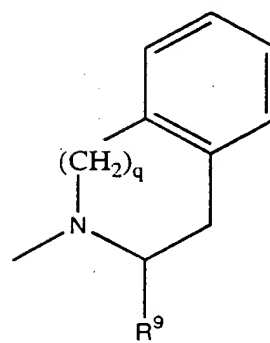
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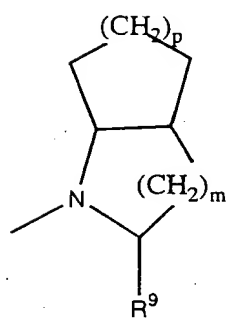
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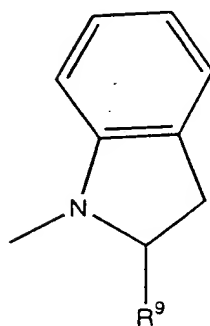
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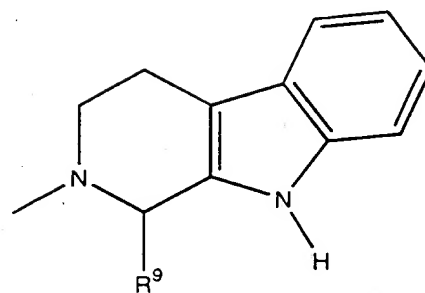
(F)



(G)

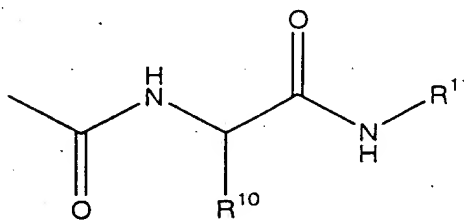


(H)



(J)

R⁹ represents hydrogen, alkyl, alkoxy carbonyl, monoalkylcarbamoyl, monoaralkylcarbamoyl, monoarylcarbamoyl or a group of the formula:



R¹⁰ and R¹¹ each represents alkyl;

R¹² represents hydrogen, hydroxy, alkoxy carbonylamino or acylamino;

R¹³ represents hydrogen, alkyl, aryl, alkoxy carbonyl or acyl;

m is 1, 2, 3, or 4;

p is 1 or 2;

q is 0, 1 or 2; and R⁶ represents hydrogen and alkyl radicals.

4. A compound of Claim 1 where Y' is oxygen.

5. A compound of Claim 1 where R² is arylthioalkyl.

6. A compound of Claim 2 where R⁴ and R⁵ together with the nitrogen atom to which they are bonded represent a bicyclic N-heterocyclic moiety.

5

7. A compound of Claim 1 where R is hydrogen, alkoxy carbonyl, arylalkyl carbonyl, heterocycle carbonyl, aminoalkanoyl, mono-substituted aminoalkanoyl, di-substituted aminoalkanoyl.

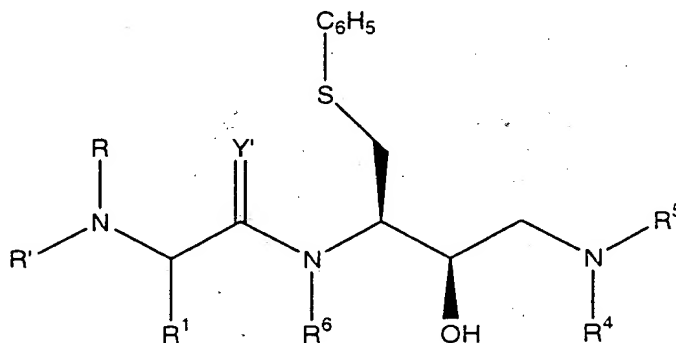
10

8. A compound of Claim 1 where R' is hydrogen.

9. A compound of Claim 3 where R¹ is hydrogen, alkyl, thioalkyl, alkylthioalkyl, alkenyl, alkynyl and cycloalkyl.

15

10. A compound of Claim 1 represented by the formula

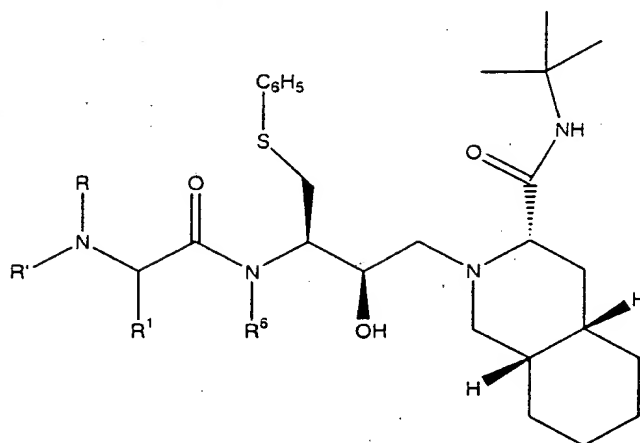


20

25 wherein R, R', R¹, R⁶, Y', R⁴ and R⁵ are as described herein.

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11. A compound of Claim 3 represented by the formula



wherein R, R', R¹, R⁶ and Y' are as described herein.

12. A pharmaceutical composition comprising a compound of Claim 1 and a pharmaceutical carrier.

13. A pharmaceutical composition comprising a compound of Claim 1 and pharmaceutical carriers.

14. Method of inhibiting a retroviral protease comprising administering a protease inhibiting amount of a compound of Claim 1.

15. Method of treating a retroviral infection comprising administering a pharmaceutical composition of a compound of Claim 1.

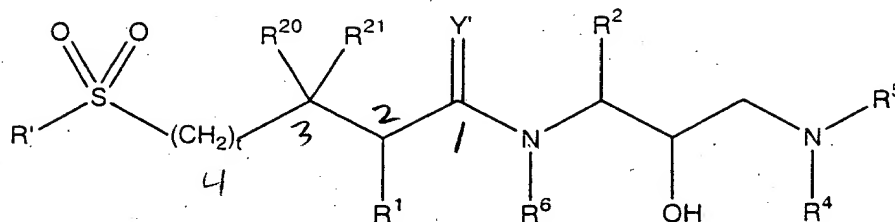
16. - Method of treating HIV infection comprising administering a pharmaceutical composition of a compound of Claim 1.

17. Method of treating AIDS comprising administering a pharmaceutical composition of a compound of Claim 1.

18. Method of treating AIDS comprising
5 administering a pharmaceutical composition of a
compound of Claim 1 in combination with other drugs
for the treatment of AIDS or the symptoms of AIDS.

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19. A compound represented by the formula:



(Formula II)

or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein:

R' represents radicals defined for R¹;

t represents either 0 or 1;

R¹ represents hydrogen, -CH₂SO₂NH₂, -CO₂CH₃, -CH₂CO₂CH₃, -C(O)NH₂, -C(O)NHCH₃, -C(O)N(CH₃)₂, -CH₂C(O)NHCH₃, -CH₂C(O)N(CH₃)₂, alkyl, alkylthioalkyl, thioalkyl and the corresponding sulfoxide and sulfone derivatives thereof, alkenyl, alkynyl, alkoxyalkyl, haloalkyl and cycloalkyl radicals and amino acid side chains selected from the group consisting of asparagine, S-methyl cysteine and the corresponding sulfoxide and sulfone derivatives thereof, glycine, leucine, isoleucine, allo-isoleucine, tert-leucine, alanine, phenylalanine, ornithine, histidine, norleucine,

glutamine, valine, threonine, allo-threonine, serine, aspartic acid and beta-cyano alanine side chains;

5 R^3 represents alkylthioalkyl, cycloalkylthioalkyl or arylthioalkyl radicals, which radicals are optionally substituted with a substituent selected from the group consisting of $-NO_2$, $-OR^{15}$, $-SR^{15}$, and halogen radicals, wherein R^{15} represents hydrogen and alkyl radicals;

10 R^3 represents hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, and heteroaralkyl radicals;

15 Y' represents O, S and NR^3 ;

R^4 and R^5 together with the nitrogen atom to which they are bonded represent a N-heterocycle;

20 R^6 represents hydrogen and alkyl radicals;

and R^{20} and R^{21} represent radicals as defined for R^1 .

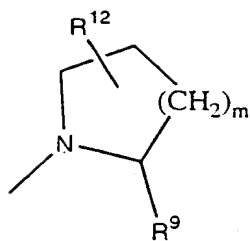
25 20. A compound of Claim 19 where R^4 and R^5 together with the nitrogen atom to which they are bonded represent a N-heterocyclic moiety containing 5, 6 or 7 members when monocyclic, 5, 6 or 7 members in a ring with 1, 2 or 3 members in a bridge when a bridged
30 monocyclic, 11, 12 or 13 members when bicyclic, and 11

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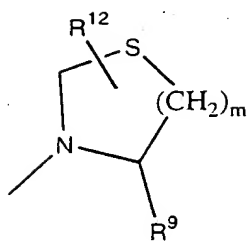
to 16 members when tricyclic; and R^6 represents hydrogen and alkyl radicals.

21. A compound of Claim 20 where R^4 and R^5 together with the nitrogen atom to which they are bonded form a N-heterocyclic moiety selected from the group consisting of formulae (A) through and including (J)

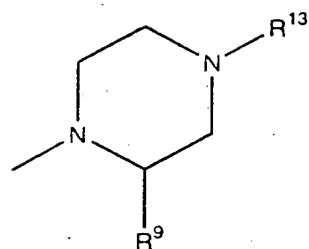
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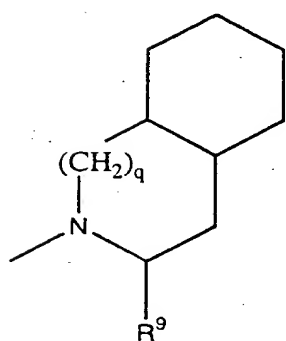
(A)



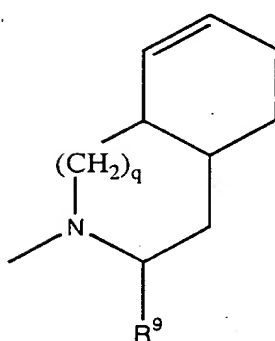
(B)



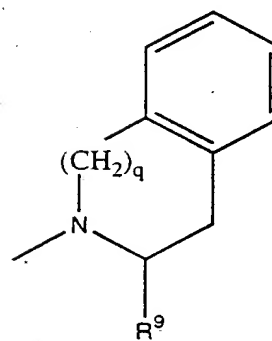
(C)



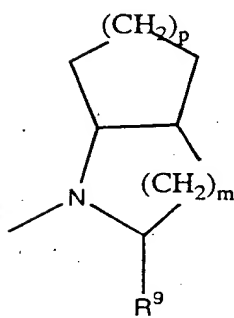
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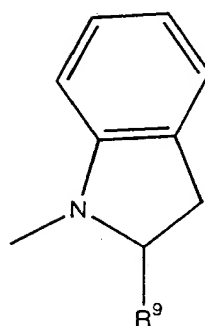
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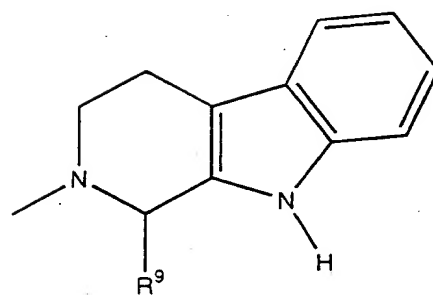
(F)



(G)



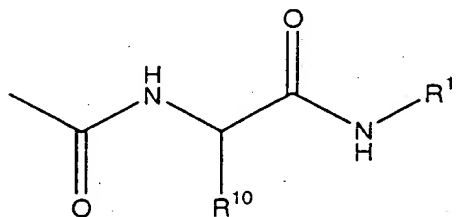
(H)



(J)

5 wherein:

R⁹ represents hydrogen, alkyl, alkoxy carbonyl, monoalkylcarbamoyl, monoaralkylcarbamoyl, monoarylcabamoyl or a group of the formula:



R¹⁰ and R¹¹ each represents alkyl;

R¹² represents hydrogen, hydroxy, alkoxy carbonylamino or acylamino;

R¹³ represents hydrogen, alkyl, aryl, alkoxy carbonyl or acyl;

m is 1, 2, 3, or 4;

p is 1 or 2;

q is 0, 1 or 2; and R⁶ represents hydrogen and alkyl radicals.

22. A compound of Claim 19 where Y' is oxygen.

23. A compound of Claim 19 where R² is arylthioalkyl.

24. A compound of Claim 19 where t is 0.

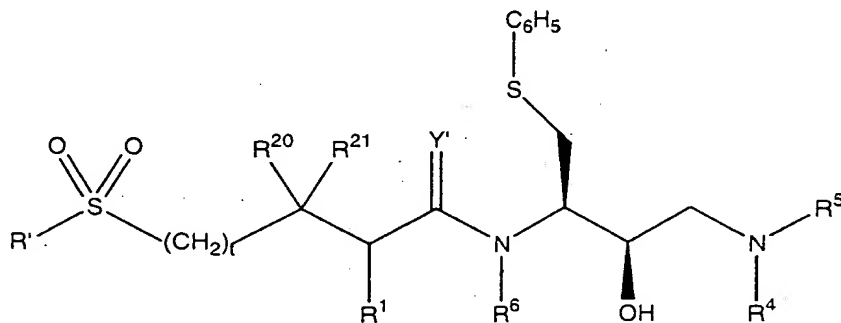
25. A compound of Claim 20 where R⁴ and R⁵ together with the nitrogen atom to which they are bonded represent a bicyclic N-heterocyclic moiety.

26. A compound of Claim 19 where R²⁰ and R²¹ are hydrogen or alkyl.

27. A compound of Claim 19 where R' is alkyl, aryl or arylalkyl.

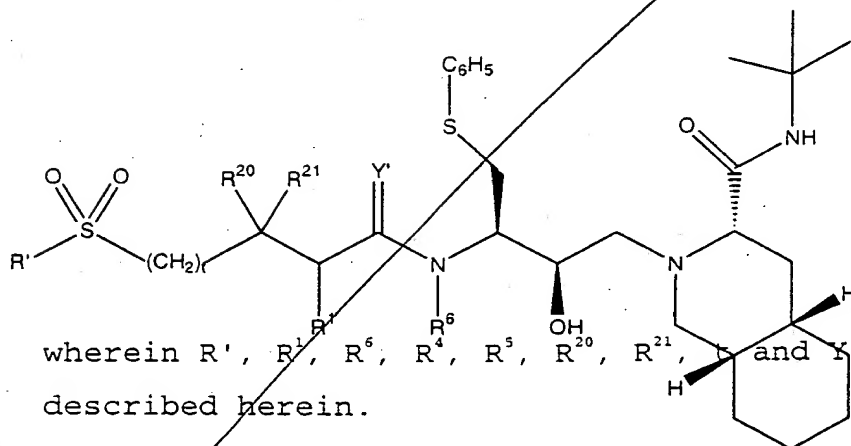
28. A compound of Claim 19 where R¹ is hydrogen, alkyl, thioalkyl, alkylthioalkyl, alkenyl, alkynyl and cycloalkyl.

29. A compound of Claim 19 represented by the Formula



wherein R', R¹, R⁶, R⁴, R⁵, R²⁰, R²¹, Y' and t are as described herein.

30. A compound of Claim 21 represented by the formula



31. A pharmaceutical composition comprising a compound of Claim 19 and a pharmaceutical carrier.

32. A pharmaceutical composition comprising a compound of Claim 19 and pharmaceutical carriers.

33. Method of inhibiting a retroviral protease comprising administering a protease inhibiting amount of a compound of Claim 19.

34. Method of treating a retroviral infection comprising administering a pharmaceutical composition of a compound of Claim 19.

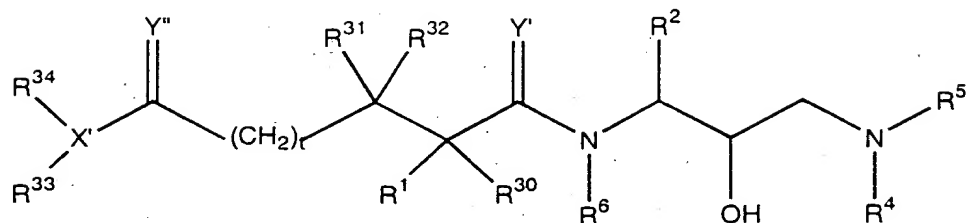
35. Method of treating HIV infection comprising administering a pharmaceutical composition of a compound of Claim 19.

36. Method of treating AIDS comprising administering a pharmaceutical composition of a compound of Claim 19.

37. Method of treating AIDS comprising
5 administering a pharmaceutical composition of a
compound of Claim 19 in combination with other drugs
for the treatment of AIDS or the symptoms of AIDS.

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38. A compound represented by the formula:



(Formula III)

or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein:

t represents either 0 or 1;

R¹ represents hydrogen, -CH₂SO₂NH₂, -CO₂CH₃, -CH₂CO₂CH₃, -C(O)NH₂, -C(O)NHCH₃, -C(O)N(CH₃)₂, -CH₂C(O)NHCH₃, -CH₂C(O)N(CH₃)₂, alkyl, thioalkyl, thioalkyl and the corresponding sulfoxide and sulfone derivatives thereof, alkenyl, alkynyl, alkoxyalkyl, haloalkyl and cycloalkyl radicals and amino acid side chains selected from the group consisting of asparagine, S-methyl cysteine and the corresponding sulfoxide and sulfone derivatives thereof, glycine, leucine, isoleucine, allo-isoleucine, tert-leucine, alanine,

phenylalanine, ornithine, histidine, norleucine, glutamine, valine, threonine, allo-threonine, serine, aspartic acid and beta-cyano alanine side chains;

- 5 R^2 represents alkylthioalkyl, cycloalkylthioalkyl, or arylthioalkyl radicals, which radicals are optionally substituted with a substituent selected from the group consisting of $-NO_2$, $-OR^{15}$, $-SR^{15}$, and halogen radicals, wherein R^{15} represents hydrogen and alkyl radicals;

10

R^3 represents hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, and heteroaralkyl radicals;

15

X' represent O, N and $C(R^{17})$ where R^{17} represents hydrogen and alkyl radicals;

- 20 Y' and Y'' independently represent O, S and NR^3 ;

R^4 and R^5 together with the nitrogen atom to which they are bonded represent a N-heterocycle;

- 25 R^6 represents hydrogen and alkyl radicals;

R^{30} , R^{31} and R^{32} independently represent radicals as defined for R^1 , or one of R^1 and R^{30} together with one of R^{31} and R^{32} and the carbon atoms to which they are attached form a cycloalkyl radical; and

30

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R³³ and R³⁴ independently represent radicals as defined for R³, or R³³ and R³⁴ together with X' represent cycloalkyl, aryl, heterocyclyl and heteroaryl radicals, provided that when X' is O, R³⁴ is absent.

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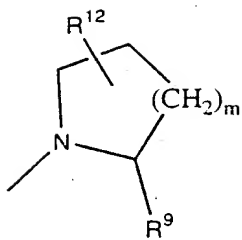
39. A compound of Claim 38 where R⁴ and R⁵ together with the nitrogen atom to which they are bonded represent a N-heterocyclic moiety containing 5, 6 or 7 members when monocyclic, 5, 6 or 7 members in a ring with 1, 2 or 3 members in a bridge when a bridged monocyclic, 11, 12 or 13 members when bicyclic, and 11 to 16 members when tricyclic; and R⁶ represents hydrogen and alkyl radicals.

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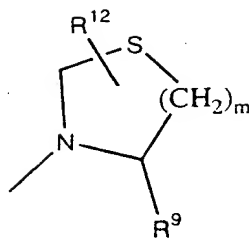
40. A compound of Claim 39 where R⁴ and R⁵ together with the nitrogen atom to which they are bonded form a N-heterocyclic moiety selected from the group consisting of formulae (A) through and including (J)

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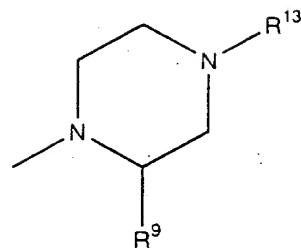
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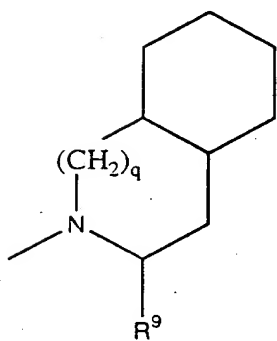
(A)



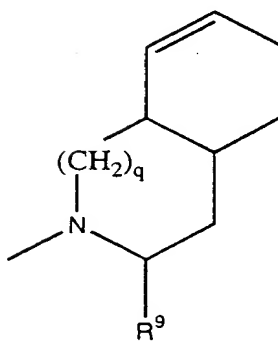
(B)



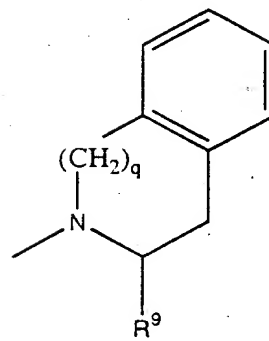
(C)



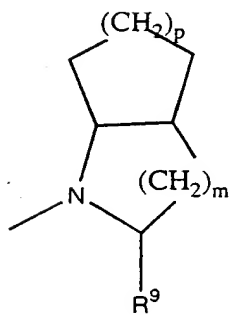
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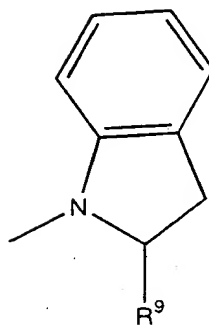
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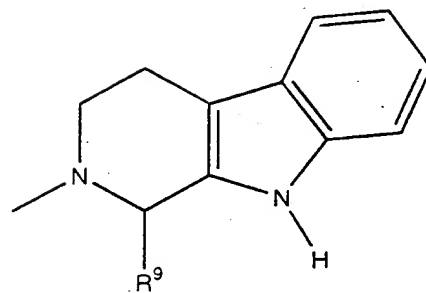
(F)



(G)

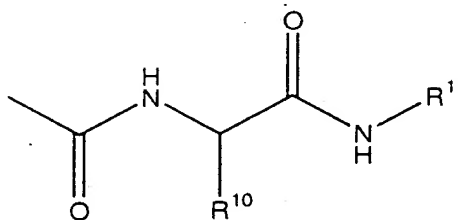


(H)



(J)

R⁹ represents hydrogen, alkyl, alkoxycarbonyl, monoalkylcarbamoyl, monoaralkylcarbamoyl, monoarylcarbamoyl or a group of the formula:



R¹⁰ and R¹¹ each represents alkyl;

R¹² represents hydrogen, hydroxy, alkoxycarbonylamino or acylamino;

R¹³ represents hydrogen, alkyl, aryl, alkoxycarbonyl or acyl;

m is 1, 2, 3, or 4;

p is 1 or 2;

q is 0, 1 or 2; and R⁶ represents hydrogen and alkyl radicals.

41. A compound of Claim 38 where Y' and Y" are oxygen.

42. A compound of Claim 38 where R^2 is arylthioalkyl.

43. A compound of Claim 38 where t is 0.

5 44. A compound of Claim 39 where R^4 and R^5 together with the nitrogen atom to which they are bonded represent a bicyclic N-heterocyclic moiety.

45. A compound of Claim 38 where X' is oxygen.

10

46. A compound of Claim 38 where X' is nitrogen.

47. A compound of Claim 38 where R^{33} and R^{34} are hydrogen, alkyl, cycloalkyl, aralkyl or haloalkyl.

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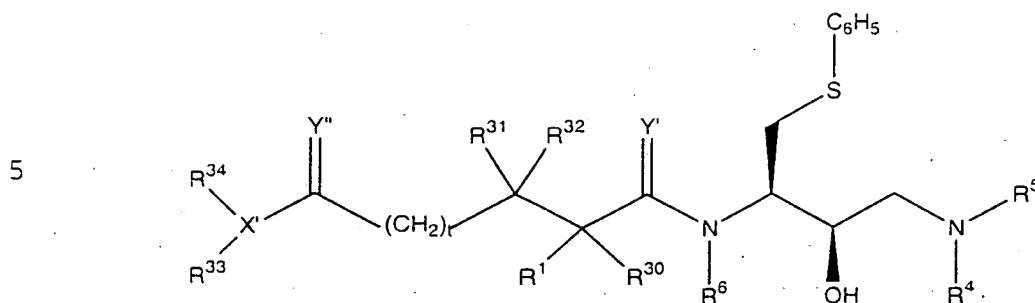
48. A compound of Claim 38 where R^{33} and R^{34} taken together with the nitrogen to which they are attached form a heterocyclic ring.

20 49. A compound of Claim 40 where R^1 is hydrogen, alkyl, thioalkyl, alkylthioalkyl, alkenyl, alkynyl and cycloalkyl.

25 50. A compound of Claim 38 where R^1 , R^{30} , R^{31} , R^{32} are hydrogen or alkyl.

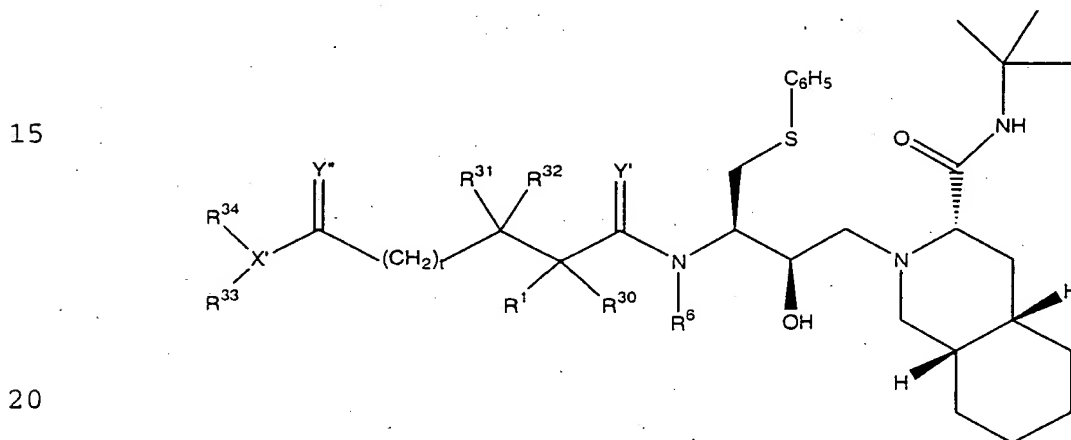
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51. A compound of Claim 38 represented by the Formula



10 wherein R^1 , R^6 , Y' , Y'' , R^4 , R^5 , R^{30} , R^{31} , R^{32} , R^{33} , R^{34} and t are as described herein.

52. A compound of Claim 40 represented by the formula



wherein R , R^1 , R^6 and Y' are as described herein.

53. A pharmaceutical composition comprising a
25 compound of Claim 38 and a pharmaceutical carrier.

54. A pharmaceutical composition comprising a
compound of Claim 38 and a pharmaceutical carriers.

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55. Method of inhibiting a retroviral protease comprising administering a protease inhibiting amount of a compound of Claim 38.

56. Method of treating a retroviral infection comprising administering a pharmaceutical composition of a compound of Claim 38.

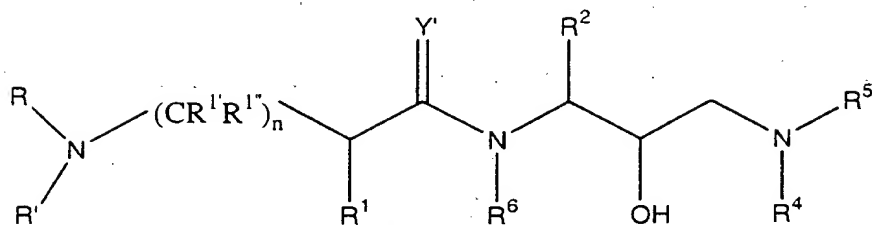
57. Method of treating HIV infection comprising administering a pharmaceutical composition of a compound of Claim 38.

58. Method of treating AIDS comprising administering a pharmaceutical composition of a compound of Claim 38.

59. Method of treating AIDS comprising administering a pharmaceutical composition of a compound of Claim 38 in combination with other drugs for the treatment of AIDS or the symptoms of AIDS.

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60. A compound represented by the formula:



(Formula IV)

or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein:

R represents hydrogen, alkoxycarbonyl, aryloxy carbonylalkyl, aralkoxycarbonyl, alkylcarbonyl, cycloalkylcarbonyl, cycloalkylalkoxycarbonyl, cycloalkylalkanoyl, alkanoyl, aralkanoyl, aroyl, aryloxy carbanoyl, aryloxyalkanoyl, heterocyclylcarbonyl, heterocycloxy carbonyl, heteroaralkoxycarbonyl, heterocyclylalkanoyl, heterocyclylalkoxycarbonyl, heteroarylcarbonyl, heteroaryloxy carbonyl, heteroaroyl, alkyl, alkenyl, cycloalkyl, aryl, aralkyl, aryloxyalkyl, heteroaryloxyalkyl, hydroxyalkyl, aralkylaminoalkylcarbonyl, aminoalkanoyl,

aminocarbonyl, aminocarbonylalkyl,
alkylaminoalkylcarbonyl, and mono- and disubstituted
aminocarbonyl and aminoalkanoyl radicals wherein the
substituents are selected from the group consisting of
5 alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl,
heteroaryl, heteroaralkyl, heterocycloalkyl, and
heterocycloalkylalkyl radicals, or in the case of
disubstituted aminoalkanoyl, said substituents along
with the nitrogen atom to which they are attached form
10 a heterocyclyl or heteroaryl radical;

R' represents radicals defined for R¹, or R and R'
together with the nitrogen to which they are attached
form a heterocycloalkyl or heteroaryl radical;

15 n represents 1 or 2;

R¹ represents hydrogen, -CH₂SO₂NH₂, -CO₂CH₃, -CH₂CO₂CH₃, -
C(0)NH₂, -C(0)NHCH₃, -C(0)N(CH₃)₂, -CH₂C(0)NHCH₃, -
20 CH₂C(0)N(CH₃)₂, alkyl, thioalkyl and the corresponding
sulfoxide and sulfone derivatives thereof, alkenyl,
alkynyl, haloalkyl, alkoxyalkyl and cycloalkyl radicals
and amino acid side chains selected from the group
consisting of asparagine, S-methyl cysteine and the
25 corresponding sulfoxide and sulfone derivatives
thereof, glycine, leucine, isoleucine, allo-isoleucine,
tert-leucine, alanine, phenylalanine, ornithine,
histidine, norleucine, glutamine, valine, threonine,
allo-threonine, serine, aspartic acid and beta-cyano
30 alanine side chains;

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R¹ and R^{1'} independently represent hydrogen and radicals as defined for R³;

5 R² represents alkylthioalkyl, cycloalkylthioalkyl, or arylthioalkyl radicals, which radicals are optionally substituted with a substituent selected from the group consisting of -NO₂, -OR¹⁵, -SR¹⁵, and halogen radicals, wherein R¹⁵ represents hydrogen and alkyl radicals;

10 R³ represents hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, and heteroaralkyl radicals;

15 Y' represents O, S and NR³;

R⁴ and R⁵ together with the nitrogen atom to which they are bonded represent a N-heterocyclic moiety;

20

R⁶ represents hydrogen and alkyl radicals.

61. A compound of Claim 60 where R⁴ and R⁵ together with the nitrogen atom to which they are bonded represent a N-heterocyclic moiety containing 5, 6 or 7 members when monocyclic, 5, 6 or 7 members in a ring with 1, 2 or 3 members in a bridge when a bridged monocyclic, 11, 12 or 13 members when bicyclic, and 11 to 16 members when tricyclic.

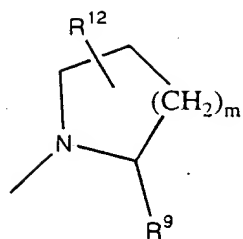
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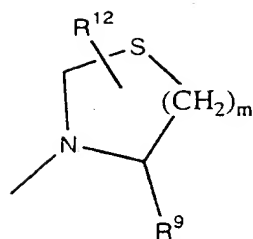
62. A compound of Claim 60 where n is 1.

63. A compound of Claim 60 where R⁴ and R⁵ together with
the nitrogen atom to which they are bonded form a N-
5 heterocyclic moiety selected from the group consisting
of formulae (A) through and including
(J)

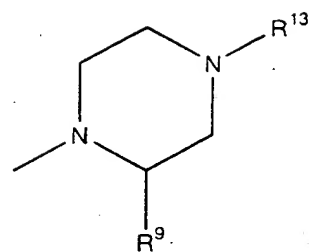
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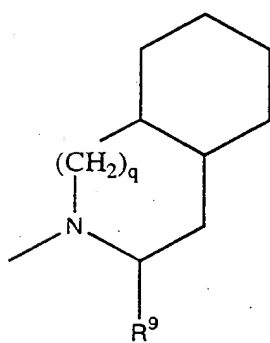
(A)



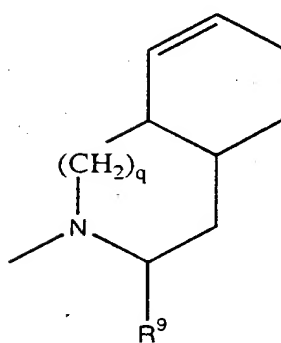
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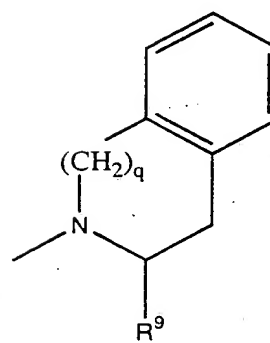
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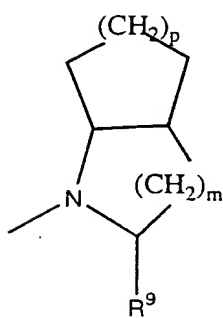
(D)



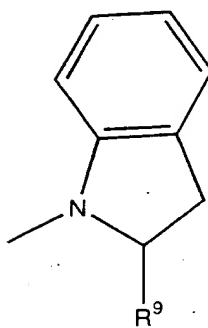
(E)



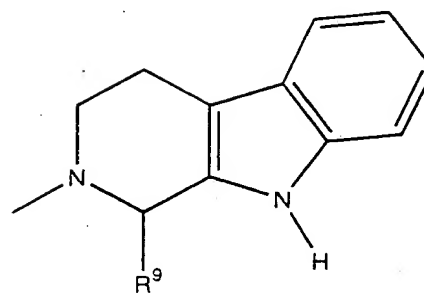
(F)



(G)



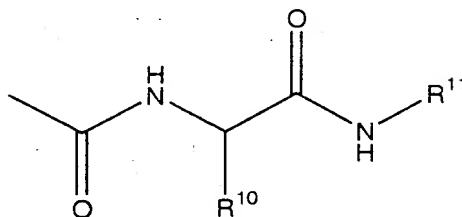
(H)



(J)

5 wherein:

R⁹ represents hydrogen, alkyl, alkoxycarbonyl, monoalkylcarbamoyl, monoaralkylcarbamoyl, monoarylcarbamoyl or a group of the formula:



R¹⁰ and R¹¹ each represents alkyl;

R¹² represents hydrogen, hydroxy, alkoxycarbonylamino or acylamino;

R¹³ represents hydrogen, alkyl, aryl, alkoxycarbonyl or acyl;

m is 1, 2, 3, or 4;

p is 1 or 2;

q is 0, 1 or 2; and R⁵ represents hydrogen and alkyl radicals.

64. A compound of Claim 60 where Y' is oxygen.

65. A compound of Claim 60 where R² is arylthioalkyl.

66. A compound of Claim 61 where R^1 and R^5 together with the nitrogen atom to which they are bonded represent a bicyclic N-heterocyclic moiety.

5

67. A compound of Claim 60 where R is hydrogen, alkoxy carbonyl, arylalkyl carbonyl, heterocycle carbonyl, aminoalkanoyl, mono-substituted aminoalkanoyl, di-substituted aminoalkanoyl.

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68. A compound of Claim 62 where $R^{1'}$ and $R^{1''}$ are hydrogen.

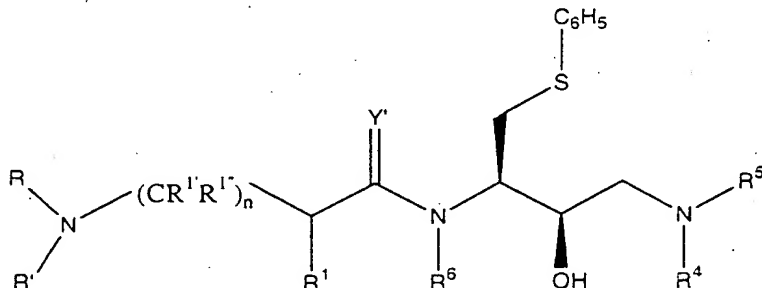
69. A compound of Claim 60 where R is hydrogen.

15

70. A compound of Claim 60 where R^1 is hydrogen, alkyl, thioalkyl, alkylthioalkyl, alkenyl, alkynyl and cycloalkyl.

20 71. A compound of Claim 60 represented by the formula

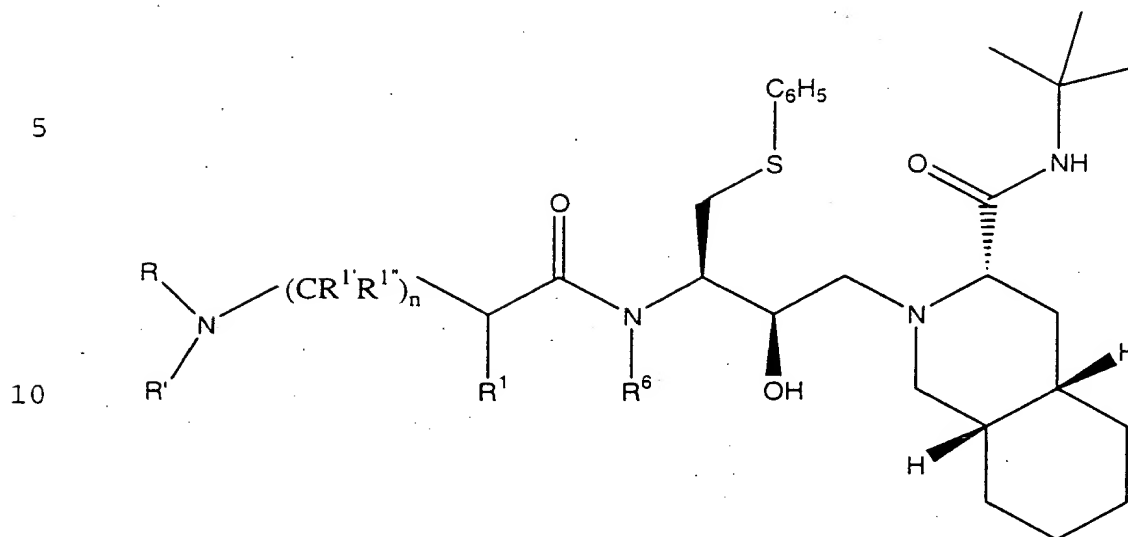
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wherein R, R^1 , $R^{1'}$, $R^{1''}$, R^6 , R^4 , R^5 and Y' are as described herein.

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72. A compound of Claim 63 represented by the formula



wherein R, R', R¹, R^{1'}, R^{1''}, R⁶ and Y' are as described herein.

73. A pharmaceutical composition comprising a compound of Claim 60 and a pharmaceutical carrier.

74. A pharmaceutical composition comprising a compound of Claim 60 and pharmaceutical carriers.

75. Method of inhibiting a retroviral protease comprising administering a protease inhibiting amount of a compound of Claim 60.

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76. Method of treating a retroviral infection comprising administering a pharmaceutical composition of a compound of Claim 60.

5 77. Method of treating HIV infection comprising administering a pharmaceutical composition of a compound of Claim 60.

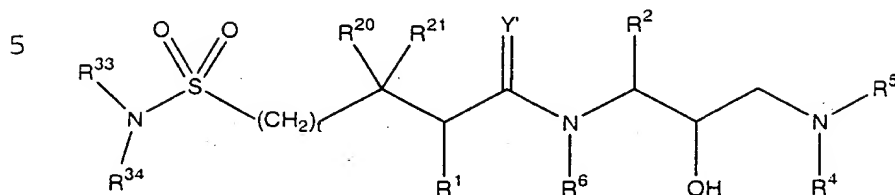
78. Method of treating AIDS comprising administering a pharmaceutical composition of a compound of Claim 60.

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79. Method of treating AIDS comprising administering a pharmaceutical composition of a compound of Claim 60 in combination with other drugs for the treatment of AIDS or the symptoms of AIDS.

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80. A compound represented by the formula:



(Formula IIa)

10
or a pharmaceutically acceptable salt, prodrug or ester thereof, wherein:

15
t represents either 0 or 1;

20
R¹ represents hydrogen, -CH₂SO₂NH₂, -CO₂CH₃, -CH₂CO₂CH₃, -C(=O)NH₂, -C(=O)NHCH₃, -C(=O)N(CH₃)₂, -CH₂C(=O)NHCH₃, -CH₂C(=O)N(CH₃)₂, alkyl, alkylthioalkyl, thioalkyl and the corresponding sulfoxide and sulfone derivatives thereof, alkenyl, alkynyl and cycloalkyl radicals and amino acid side chains selected from the group consisting of asparagine, S-methyl cysteine and the corresponding sulfoxide and sulfone derivatives thereof, glycine, leucine, isoleucine, allo-isoleucine, tert-leucine, alanine, phenylalanine, ornithine, histidine, norleucine, glutamine, valine, threonine, allo-threonine, serine, aspartic acid and
30
beta-cyano alanine side chains;

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R² represents alkylthioalkyl, cycloalkylthioalkyl or arylthioalkyl radicals, which radicals are optionally substituted with a substituent selected from the group consisting of -NO₂, -OR¹⁵, -SR¹⁵, and halogen radicals, wherein R¹⁵ represents hydrogen and alkyl radicals;

R³ represents hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heteroaryl, heterocycloalkylalkyl, aryl, aralkyl, and heteroaralkyl radicals;

Y' represents O, S and NR³;

R⁴ and R⁵ together with the nitrogen atom to which they are bonded represent a N-heterocycle;

R⁶ represents hydrogen and alkyl radicals;

R³³ and R³⁴ independently represent radicals as defined for R³, or R³³ and R³⁴ together with the nitrogen to which they are attached form heterocyclyl and heteroaryl radicals;

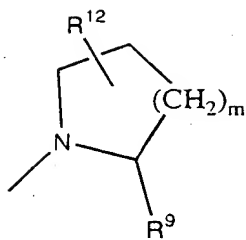
and R²⁰ and R²¹ represent radicals as defined for R¹.

81. A compound of Claim 80 where R⁴ and R⁵ together with the nitrogen atom to which they are bonded represent a N-heterocyclic moiety containing 5, 6 or 7 members when monocyclic, 5, 6 or 7 members in a ring with 1, 2 or 3 members in a bridge when a bridged.

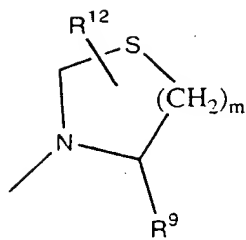
monocyclic, 11, 12 or 13 members when bicyclic, and 11 to 16 members when tricyclic; and R^6 represents hydrogen and alkyl radicals.

- 5 82. A compound of Claim 80 where R^4 and R^5 together with the nitrogen atom to which they are bonded form a N-heterocyclic moiety selected from the group consisting of formulae (A) through and including (J)

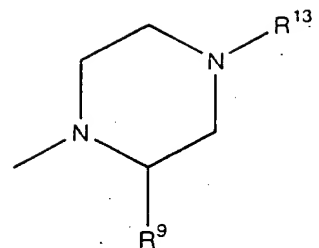
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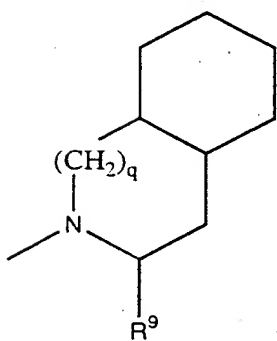
(A)



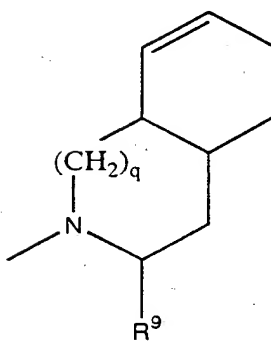
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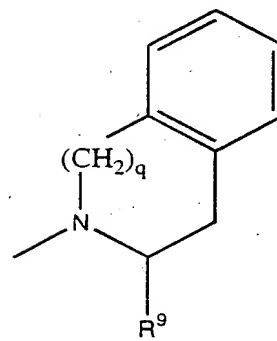
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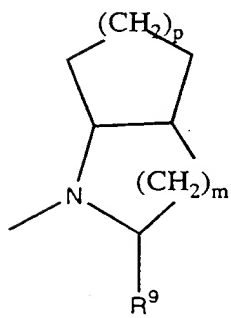
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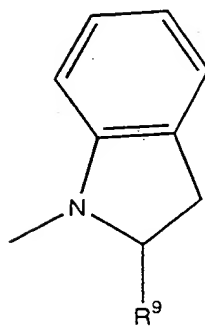
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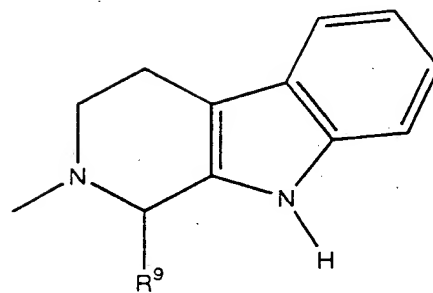
(F)



(G)

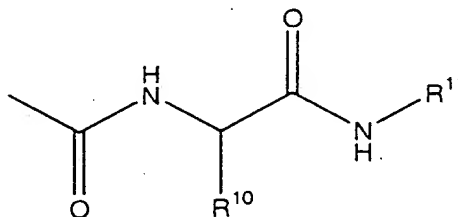


(H)



(J)

R⁹ represents hydrogen, alkyl, alkoxycarbonyl, monoalkylcarbamoyl, monoaralkylcarbamoyl, monoarylcarbamoyl or a group of the formula:



R¹⁰ and R¹¹ each represents alkyl;

R¹² represents hydrogen, hydroxy, alkoxycarbonylamino or acylamino;

R¹³ represents hydrogen, alkyl, aryl, alkoxycarbonyl or acyl;

m is 1, 2, 3, or 4;

p is 1 or 2;

q is 0, 1 or 2; and R⁶ represents hydrogen and alkyl radicals.

83. A compound of Claim 80 where Y' is oxygen.

84. A compound of Claim 80 where R² is arylthioalkyl.

85. A compound of Claim 80 where t is O.

86. A compound of Claim 81 where R¹ and R⁵ together with the nitrogen atom to which they are bonded represent a bicyclic N-heterocyclic moiety.

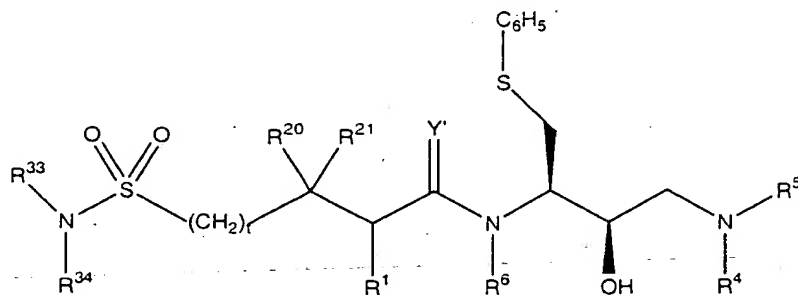
87. A compound of Claim 80 where R³³ and R¹⁴ are hydrogen, alkyl, cycloalkyl, aralkyl or haloalkyl.

88. A compound of Claim 80 where R³³ and R¹⁴ taken together with the nitrogen to which they are attached form a heterocyclic ring.

89. A compound of Claim 80 where R¹ is hydrogen, alkyl, thioalkyl, alkylthioalkyl, alkenyl, alkynyl and cycloalkyl.

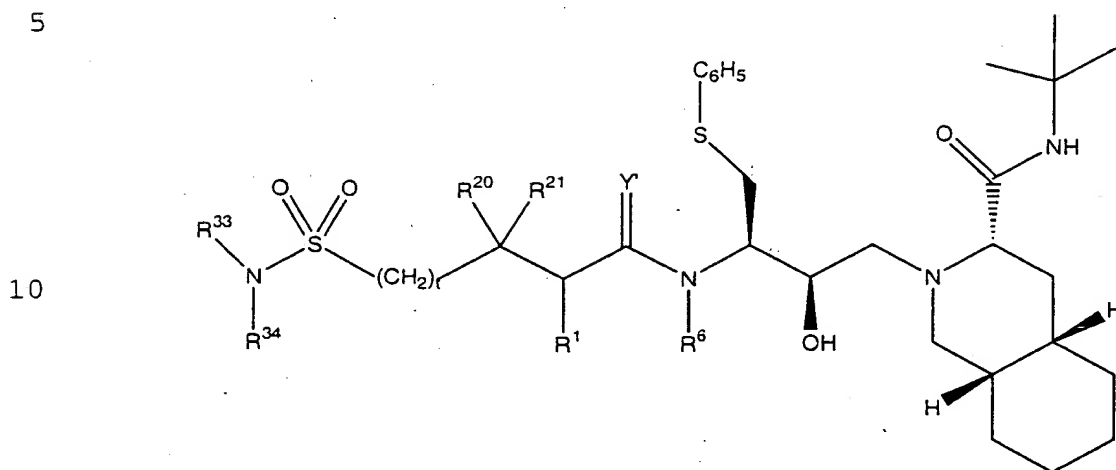
90. A compound of Claim 80 where R²⁰ and R²¹ are hydrogen or alkyl.

91. A compound of Claim 80 represented by the Formula



wherein R^1 , R^6 , R^4 , R^5 , R^{20} , R^{21} , R^{33} , R^{34} , t and Y' are as described herein.

92. A compound of Claim 82 represented by the formula



wherein R^1 , R^6 , R^{20} , R^{21} , R^{33} , R^{34} , t and Y' are as described herein.

93. A pharmaceutical composition comprising a compound of Claim 80 and a pharmaceutical carrier.

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94. A pharmaceutical composition comprising a compound of Claim 80 and a pharmaceutical carriers.

95. Method of inhibiting a retroviral protease comprising administering a protease inhibiting amount of a compound of Claim 80.

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96. Method of treating a retroviral infection comprising administering a pharmaceutical composition of a compound of Claim 80.

5 97. Method of treating HIV infection comprising administering a pharmaceutical composition of a compound of Claim 80.

10 98. Method of treating AIDS comprising administering a pharmaceutical composition of a compound of Claim 80.

15 99. Method of treating AIDS comprising administering a pharmaceutical composition of a compound of Claim 80 in combination with other drugs for the treatment of AIDS or the symptoms of AIDS.

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